

STN	Zostavy dosiek s plošnými spojmi. Časť 2: Čiastočná špecifikácia. Požiadavky na povrchovo montované spájkované zostavy.	STN EN 61191-2 35 9041
------------	--	--

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/14

Obsahuje: EN 61191-2:2013, IEC 61191-2:2013

Oznámením tejto normy sa od 10.7.2016 ruší
STN EN 61191-2 (35 9041) z júla 2001

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61191-2

October 2013

ICS 31.190; 31.240

Supersedes EN 61191-2:1998

English version

**Printed board assemblies -
Part 2: Sectional specification -
Requirements for surface mount soldered assemblies
(IEC 61191-2:2013)**

Ensembles de cartes imprimées -
Partie 2: Spécification intermédiaire -
Exigences relatives à l'assemblage par
brasage pour montage en surface
(CEI 61191-2:2013)

Elektronikaufbauten auf Leiterplatten -
Teil 2: Rahmenspezifikation -
Anforderungen an gelötete Baugruppen in
Oberflächenmontage
(IEC 61191-2:2013)

This European Standard was approved by CENELEC on 2013-07-10. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 91/1091/FDIS, future edition 2 of IEC 61191-2, prepared by IEC/TC 91 "Electronics assembly technology " was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61191-2:2013.

The following dates are fixed:

- latest date by which the document has (dop) 2014-04-10
to be implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2016-07-10
standards conflicting with the
document have to be withdrawn

This document supersedes EN 61191-2:1998.

EN 61191-2:2013 includes the following significant technical changes with respect to EN 61191-2:1998:

- IPC-A-610 on workmanship has been included as a normative reference;
- some of the terminology used in the document has been updated;
- references to EN standards have been corrected;
- the use of lead-free solder paste and plating are addressed.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61191-2:2013 was approved by CENELEC as a European Standard without any modification.

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61191-1	2013	Printed board assemblies Part 1: Generic specification - Requirements for soldered electrical and electronic assemblies using surface mount and related assembly technologies	EN 61191-1	2013
IPC-A-610E	2010	Acceptability of Electronic Assemblies	-	-



IEC 61191-2

Edition 2.0 2013-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Printed board assemblies –
Part 2: Sectional specification – Requirements for surface mount soldered
assemblies**

**Ensembles de cartes imprimées –
Partie 2: Spécification intermédiaire – Exigences relatives à l'assemblage par
brasage pour montage en surface**



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2013 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.

If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de la CEI ou du Comité national de la CEI du pays du demandeur.

Si vous avez des questions sur le copyright de la CEI ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de la CEI de votre pays de résidence.

IEC Central Office
 3, rue de Varembe
 CH-1211 Geneva 20
 Switzerland

Tel.: +41 22 919 02 11
 Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

Useful links:

IEC publications search - www.iec.ch/searchpub

The advanced search enables you to find IEC publications by a variety of criteria (reference number, text, technical committee,...).

It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available on-line and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary (IEV) on-line.

Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de la CEI

La Commission Electrotechnique Internationale (CEI) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications CEI

Le contenu technique des publications de la CEI est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Liens utiles:

Recherche de publications CEI - www.iec.ch/searchpub

La recherche avancée vous permet de trouver des publications CEI en utilisant différents critères (numéro de référence, texte, comité d'études,...).

Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

Just Published CEI - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications de la CEI. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne au monde de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans les langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (VEI) en ligne.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.



IEC 61191-2

Edition 2.0 2013-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Printed board assemblies –
Part 2: Sectional specification – Requirements for surface mount soldered
assemblies**

**Ensembles de cartes imprimées –
Partie 2: Spécification intermédiaire – Exigences relatives à l'assemblage par
brasage pour montage en surface**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

U

ICS 31.190; 31.240

ISBN 978-2-83220-856-4

Warning! Make sure that you obtained this publication from an authorized distributor. Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.
--

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Conventions	6
4 General requirements	6
5 Classification	6
6 Surface mounting of components.....	7
6.1 General	7
6.2 Alignment requirements.....	7
6.3 Process control	7
6.4 Surface mounted component requirements.....	7
6.5 Flatpack lead forming.....	7
6.5.1 General	7
6.5.2 Surface mounted device lead bends	8
6.5.3 Surface mounted device lead deformation	8
6.5.4 Flattened leads.....	8
6.5.5 Dual-in-line packages (DIPs)	8
6.5.6 Parts not configured for surface mounting	9
6.6 Small devices with two terminations	9
6.6.1 General	9
6.6.2 Stack mounting.....	9
6.6.3 Devices with external deposited elements	9
6.7 Lead component body positioning	9
6.7.1 General	9
6.7.2 Axial-leaded components.....	9
6.7.3 Other components	9
6.8 Parts configured for butt lead mounting	9
6.9 Non-conductive adhesive coverage limits	10
7 Acceptance requirements	10
7.1 General.....	10
7.2 Control and corrective actions	10
7.3 Surface soldering of leads and terminations	10
7.3.1 General	10
7.3.2 Solder fillet height and heel fillets	10
7.3.3 Flat ribbon L and gull-wing leads	13
7.3.4 Round or flattened (coined) leads	13
7.3.5 J leads.....	15
7.3.6 Rectangular or square end components.....	16
7.3.7 Cylindrical end cap terminations	17
7.3.8 Bottom only terminations	18
7.3.9 Leadless chip carriers with castellated terminations.....	19
7.3.10 Butt joints	20
7.3.11 Inward L-shaped ribbon leads.....	21
7.3.12 Flat lug leads.....	22
7.4 General post-soldering requirements applicable to all surface-mounted assemblies	23

7.4.1	Dewetting	23
7.4.2	Leaching.....	23
7.4.3	Pits, voids, blowholes, and cavities.....	23
7.4.4	Solder wicking	23
7.4.5	Solder webs and skins	23
7.4.6	Bridging	23
7.4.7	Degradation of marking	23
7.4.8	Solder spikes.....	23
7.4.9	Disturbed joint	23
7.4.10	Component damage	24
7.4.11	Open circuit, non-wetting.....	24
7.4.12	Component tilting	24
7.4.13	Non-conducting adhesive encroachment.....	24
7.4.14	Open circuit, no solder available (skip)	24
7.4.15	Component on edge	24
8	Rework and repair	24
Annex A (normative)	Placement requirements for surface mounted devices	26
Figure 1	– Lead formation for surface mounted device	8
Figure 2	– Fillet height	12
Figure 3	– Flat ribbon L and gull-wing leads.....	13
Figure 4	– Round or flattened (coined) lead joint.....	14
Figure 5	– J lead joint	15
Figure 6	– Rectangular or square end components	16
Figure 7	– Cylindrical end-cap terminations	17
Figure 8	– Bottom only terminations	18
Figure 9	– Leadless chip carriers with castellated terminations	19
Figure 10	– Butt joints.....	20
Figure 11	– Inward L-shaped ribbon leads	21
Figure 12	– Flat lug leads	22
Table 1	– Surface mounted solder joint defects.....	25

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRINTED BOARD ASSEMBLIES –**Part 2: Sectional specification –
Requirements for surface mount soldered assemblies**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61191-2 has been prepared by IEC technical committee 91: Electronics assembly technology.

This second edition cancels and replaces the first edition, published in 1998, and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- IPC-A-610 on workmanship has been included as a normative reference;
- some of the terminology used in the document has been updated;
- references to IEC standards have been corrected;
- the use of lead-free solder paste and plating are addressed.

The text of this standard is based on the following documents:

FDIS	Report on voting
91/1091/FDIS	91/1103/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of IEC 61191 under the general title *Printed board assemblies* can be found in the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

PRINTED BOARD ASSEMBLIES –

Part 2: Sectional specification – Requirements for surface mount soldered assemblies

1 Scope

This part of IEC 61191 gives the requirements for surface mount solder connections. The requirements pertain to those assemblies that are totally surface mounted or to the surface mounted portions of those assemblies that include other related technologies (e.g. through-hole, chip mounting, terminal mounting, etc.).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61191-1:2013, *Printed board assemblies – Part 1: Generic specification – Requirements for soldered electrical and electronic assemblies using surface mount and related assembly technologies*

IPC-A-610E:2010, *Acceptability of Electronic Assemblies*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN